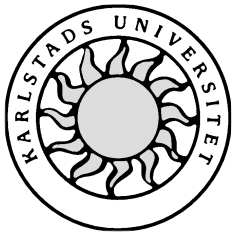

Computer Science

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Multi-Channel Anypath Routing for Multi-Channel Wireless Mesh Networks

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Opposition Report, E -level

2010:xx

1 A General Evaluation of the Project

We found the project compelling throughout the thesis. Even though the single test performed, at the end of the project, gave a good indicator that the work yielded the desired results, we would have liked to have seen more tests. In particular, a comparison between AP-OSLR and algorithms from related works. Given all the argumentation in the thesis, we do not doubt that the AP-OSLR implementation would have performed favourable when compared to the other options presented in the paper.

2 Comments on the Project in Relation to the Thesis

2.1 Title

The title reflects the contents of the project well.

2.2 Thesis Layout

The chapters follow the expected outline with the exception of the merge of the Evaluation and Conclusion chapters. We would have liked a standalone conclusion chapter to clearly conclude the thesis. As it is now the conclusions are mixed in with the evaluations which left us feeling like the thesis ended abruptly. For example, a subchapter dedicated to future research is missing.

2.3 Scientific Method

The problem with routing algorithms used currently in wireless mesh networks is presented well. The result of the test in the last chapter shows that the solution developed solves the weaknesses pointed out. The only concern is that only one test was performed.

2.4 Argumentation and Conclusions

The starting point of the thesis is that the hop count metric is a poor metric to use as a basis for routing in wireless mesh networks. This claim is established by clear arguments for why

and by giving references to other related work. Another metric, based on combining ETT with SC, is presented as superior. While compelling arguments are made of why the ETT/SC metric is superior, the test in the end of the thesis only takes into consideration the SC and algorithm changes. In theory, if hop count or ETX was used together with SC and the algorithm changes during the test, the results would be identical.

The thesis contains some contradictions, for example in the beginning of the background section the channel-switching is said to cause significant overhead in terms of delay. But four pages later the switching delay is said to mainly be a problem when it comes to broadcasting.

2.5 The Abstract

The abstract is well written. It presents the reader with a problem for current routing algorithms used in wireless mesh networks and clearly states the goal of the thesis. However, the result of the work done is never presented.

According to slides from the introduction course, the length of the abstract should be around 250 words. The abstract in the thesis contains more than 400 words, which seem a bit lengthy. To shorten the abstract, less space could be spent on background information, such as the paragraph comparing wired to wireless networks. If references are allowed in the abstract, they would add more credibility to the text. There are sentences used in the abstract that are similar to ones used in other parts of the thesis, where they are given references.

2.6 Language Aspects

The text is easy to understand and follow. While we found some spelling and grammatical errors the majority of the points came across.

2.7 References and Sources

The references that are used in the thesis are of high quality, with the exception of the last four which are all too vague, for example the book “Computer Networking: A Top-Down Approach Featuring the Internet” exists in many editions and the reference does not specify which one.

There are way too few references used in the background chapter, specifically when it concerns terminology. Words such as *Interface*, *Link* and *Path* lack references for example.

Addressing this shortcoming would bring the total number of references closer to the goal of about 30-40 references.

2.8 General Comments on the Project

Developing better routing and forwarding algorithms for wireless mesh networks are important. The thesis didn't describe any problems encountered during the work nor if the respondent gained any new knowledge as a direct consequence of the work done.

3 Chapter by Chapter Evaluation of the Thesis

3.1 Chapter 1 - Introduction

The chapter has an overall good structure which gives the impression of explaining in detail what the thesis is about and the results. However, when reading through the text the purpose of the thesis is not explained as well as one might have hoped; too many details are explained too early. Missing from the introduction is a clear statement of what was achieved in the thesis. Page 6 of the introduction looks out of place.

3.2 Chapter 2 - Background

We’re missing the big picture concerning the system overview and more detailed information about mesh networks (Where are they used? How do they work in detail?). Throughout the background section there is a lack of references to external sources as well as to Figure 2.1. In Figure 2.1 there are several components which have not been described at all. An explanation of what an “ioctl call” is should be included somewhere in the chapter.

3.3 Chapter 3 - Design

A good chapter that builds nicely on what was previously explained. What needs work is the flow and usage of the figures within the text; they bring great value to the chapter but needs to be explained in greater detail and referred to. The table on page 31 should get a description and be part of a list of tables (or be treated as a figure). Towards the end of the chapter an alternative forwarding algorithm is presented that shows the benefits of the

selected algorithm in a clear way. Subsections 3.5.1 and 3.5.2 needs to be explained in more detail.

3.4 Chapter 4 - Implementation

When arriving at this chapter we expected in-depth details about the implementation of the algorithms and changes needed described in the design. The implementation chapter is however quite shallow, it spoke more about old and new design-elements rather than how they were implemented. Things we expected from this chapter were:

- Programming language.
- Data structures and system architecture.
- List of new or modified data structures and methods broken down according to the subprojects, routing algorithm and forwarding method. Ideally this should show exactly what was contributed to and changed in the software used as a foundation.

Although we did not find what we expected, the chapter still introduces components closer to the implementation level than the previous chapters together with valuable insights into how the different components of the design works.

3.5 Chapter 5 – Conclusions and Evaluation

This chapter feels like a combination of two distinct chapters, one evaluating AP-OLSR and the other discussing problems and future work. Since the chapters were merged it was somewhat difficult to understand the structure of the chapter. Beginning in chapter 5 the work done is well described except for missing the result of the forwarding algorithm. This is followed by a test which confirms that AP-OSLR reduces the switching delay, fulfilling the main goal of the project. The potential problems with AP-OSLR and future work are briefly discussed. Actual problems encountered during the project are missing.

3.6 General Comments on the Thesis

In general there is a lack of references to figures throughout the thesis. Some of the figures take up way too much space. There are also two tables which should be considered as actual tables (or figures) in the thesis on pages 31 and 51, right now they're just floating around. When reading the thesis some points were mentioned several times. Some repetition is a good thing, too much of it can give the opposite effect.

4 Final Comments

Even though we've been critical of parts of the thesis the overall impression was positive. The project was successful and the main points were understood. The thesis leaves us convinced of the benefits of AP-OSLR, but with a desire to see more tests using different scenarios.